



The Stat Teaser



Stat-Ease, Incorporated

"Statistics Made Easy"™

Spring 1995

Visit and Ask Questions at the Annual Quality Congress



This year's Annual Quality Congress is being held in Cincinnati on May 22-24. Stat-Ease Corporation will be there offering tips and demonstrations. We invite you to visit and ask us questions about:

- design of experiments
- product/process improvement
- optimization
- industrial R&D breakthroughs

Don't expect any "sales hyperbole" when you arrive. Stat-Ease Corporation principals Mark Anderson and Tryg Helseth will show you how to use DOE to improve product quality and slash production costs. (*That IS why you're interested in Design-Ease® and Design-Expert® software, isn't it?*)

If your problem-solving Design of Experiments skills aren't honed, join us at an **Experimental Design Made Easy** workshop:

- ⇒ June 13-16, 1995 (Minneapolis, MN)
- ⇒ Sept. 12-15, 1995 (Minneapolis)
- ⇒ Nov. 7-10, 1995 (Philadelphia, PA)

Attn: DOE Trainers!

Stat-Ease Corporation can supply low-cost, time-limited Design-Ease software to trainers of computer-intensive workshops. Students may use the software after the workshop for 90 days. This assures they won't lose momentum while tooling up for DOE breakthroughs.

Contact us to learn more about this special **DOE Trainer Bundle** package. Call toll-free at 800-325-9807. Rich Burnham is available to answer your questions.

Baldrige Award Winner Presents Coveted Recognition Certificates

Motorola recently bestowed on Design-Ease® software high marks in improving Motorola's productivity, quality, and operating costs. Motorola's internal Intelligent Software Acquisition Program (through their MOTsan Software

Evaluation Program) in San Diego, spent more than three months evaluating Design-Ease. Over 30 people with diversified backgrounds in work experience, education, and cultural diversity participated in the thorough evaluation.

Both the Macintosh™ and Windows™ version of the Design-Ease software underwent extensive testing. Quoting the certificate award in part, Stat-Ease Corporation learned the following:

"The Windows version[...]and the Macintosh version [met] Motorola MOTsan Criteria and Expectations in very productive mathematical-statistical analysis and modeling tools in graphical user environments."



Motorola tested the software on over 32 machine configurations, including a large variety of adapters, memory managers, and other components.

The evaluation award also praised the software in the following sentence:

"Design-Ease® versions [...] for Windows™ and Macintosh™ were products that produced very good Motorola desktop user productivity with mathematical and statistical design, analysis and modeling performance with charts and graphs at the quality and consistent customizable levels of acceptance by Motorola."

Motorola won the first Malcolm Baldrige National Quality Award in 1988, in recognition of its superior company-wide management of quality processes. We are honored to be recognized. To obtain Design-Ease® software (Windows™ or Macintosh™ version 3), dial 800-325-9807. Upgrades cost \$195. Full packages sell for \$395.

Introducing "The Expert's Corner" Next Issue

Do you have a question you'd like answered by one of our DOE experts? How about a "sanity check" on the validity of that technique you "discovered" during a recent experiment? Or what about that idea of yours you'd like addressed.

Beginning in the next issue of *The Stat Teaser*, we'll be opening this corner of the newsletter to DOE answers from one of our experts. If we use your idea, tip, or question,

we'll give you a byline and a \$100 rebate on your next workshop with us! Even better, you'll get an opportunity to see how a Stat-Ease Corporation staff member uses Design-Ease and Design-Expert to solve real-world problems.

Fax your submission to Rich Burnham at (612) 378-2152. We'll also take your call (on our dime, too) at 800-325-9807. Start thinking and searching!

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Software • Training • Consulting

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Mobil Chemical Formulation Earns SME Attention

Manufacturing Engineering is the publication of the Society of Manufacturing Engineers [SME]. Members of SME were treated in the April '95 issue to the following case study touting Design-Expert. The screen shot is copywritten by Stat-Ease Corporation and is not a part of the published article. We have included it here for your reference.

PRODUCTION LINES

SOFTWARE NARROWS FLUID FIELD

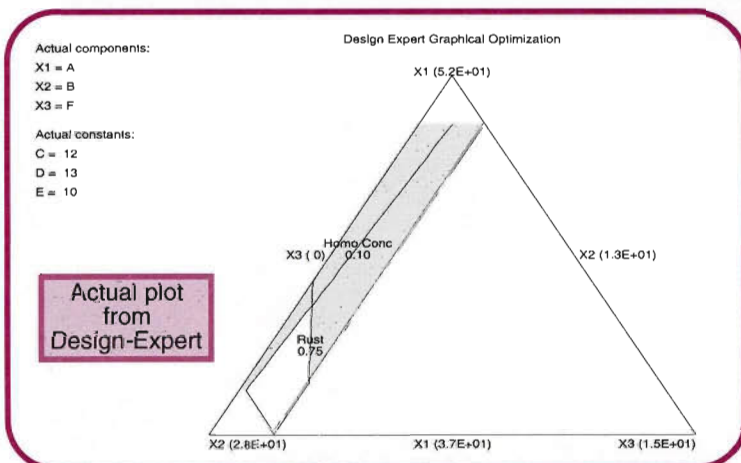
Chemists of the Mobil Chemical Co. (Princeton, NJ) had to design a new cutting fluid. According to Dr. Thomas Giacobbe, a research associate in the Chemical Products Division, "We wanted a long lasting cutting fluid with no biocides, that did not cause skin irritations."

The initial task was to select from the many compounds available to produce the right fluid. Initial research reduced the number of possible ingredients to six. However, the blending is complicated by the fact that the proportions of one fluid to another can vary greatly, so the number of variables to

consider are increased by the quantity of each fluid used in a blend. "We estimated that it would take a year to find the best combinations," said Thomas O'Brien, senior staff engineer.

To speed the process, the Mobil chemists decided to use a software package called Design-Expert® from Stat-Ease, Inc. (Minneapolis) based on statistical design of experiments methodology. It contains equations that can predict what will happen for any given combination.

"When we entered our six components, and their ranges, the program suggested 28 blends. The program also produces a menu for each blend. In four hours we made the blends and began the evaluation," says O'Brien.



Mobil Chemical's ideal formulation is the "sweet spot" in the lower left of the triangular plot. One year's work was completed in four weeks.

Tests of actual blends removed a few from consideration because they lacked some key performance feature. The chemists then turned back to the program for a further evaluation of the survivors.

Using program equations again, they made up charts to predict the responses for combinations of the input components. The researchers were

then able to identify "sweet spots," or areas where all the performance specifications were achieved. With this system, Mobil chemists produced a new optimized cutting fluid, Mobilmet Aqua Rho, with minimal experimentation.

The Design-Expert® software is also suitable for process development and product optimization. Any analysis would follow this sequence: gather data, use software to design a test, carry out the test, have the software analyze test data and make recommendations, confirm the results with additional tests.

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Manufacturing Engineering Magazine -- 1995.*

(For a detailed, 9-page discussion of Mobil's experimental design using Design-Expert, call us at 800-325-9807.

*Engage your company in an in-house offering of our **Mixture Design for Optimal Formulation** workshop. Gain an in-depth understanding of statistical design and analysis tools for mixtures.)*

Design-Ease Speaks



and



Stat-Ease Corporation has earned the right to display the Windows™ and Macintosh™ logos for Design-Ease® version 3 software. To earn and keep these rights, we maintain a high level of quality in the products and upgrades we create for you. That means we meet or exceed industry standards.

The reason Design-Ease fits so well with the graphical user interfaces is because of the stiff requirements Microsoft and Apple demand.

If you use Design-Ease version 1 or 2, you may upgrade to either the Windows or Macintosh version 3 for only \$195. Call us.

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"One of the best DOE classes
I have attended in the 12 years
I've been working with DOEs."

— Bill Hayes
September '94
R&D Manager for Friction Materials
Rockwell International